Notice of Allowability	Application No.	Applicant(s)	
	09/972,375	OKAWA ET AL.	
	Examiner	Art Unit	
	Mark Ruthkosky	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *2/3/2006*.

2. ☒ The allowed claim(s) is/are *1-13*.

3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All b) ☐ Some* c) ☐ None of the:
      1. ☒ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

MARK RUTHKOSKY
PRIMARY EXAMINER
4/13/2006

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/3/2006 has been entered.

Allowable Subject Matter

Claims 1-13 are allowed.

The following is an examiner's statement of reasons for allowance:

The instant claims are to a non-aqueous secondary cell comprising a cathode employing cathode active material containing the compound of an olivine structure of the formula $Li_xFe_{1-y}M_yPO_4$, as claimed wherein M is at least one selected from the group consisting of Zn, Al, Ga, Mg, and, wherein $0.05< x < 1.2$ and $0 < y$ 0.8 and wherein the cathode has a width, an electrolyte solution and an anode having a width, where the contents are housed in a container and wherein the amount of electrolyte solution in the container is adjusted to provide a void in the container of not less than 0.14 cc and not larger than 0.21 cc per 1 Ah of the cell capacity, and wherein the difference, t, between the width of the anode and the width of the cathode is 0.05 mm to 0.2 mm.

The prior art does not teach a non-aqueous secondary cell comprising a cathode employing cathode active material containing the compound of an olivine structure of the

formula $Li_xFe_{1-y}M_yPO_4$, as claimed, wherein the contents are housed in a container and the amount of electrolyte solution in the container is adjusted to provide a void in the container of not less than 0.14 cc and not larger than 0.21 cc per 1 Ah of the cell capacity, and wherein the difference, t, between the width of the anode and the width of the cathode is 0.05 mm to 0.2 mm. Applicant states that the combination of active materials, thickness of the electrodes and amount of electrolyte gives improved energy density and requires less interior void than cells with different active materials (arguments of 2/3/2006.)

The most pertinent prior art has been cited. Goodenough et al. (US 5,910,382) teaches a cathode active material containing the compound of an olivine structure of the formula $Li_xFe_{1-y}M_yPO_4$, for a non-aqueous secondary cell, an electrolyte and an anode, where the contents are housed in a container. $LiFePO_4$ is specifically noted (claims 1-9.) Lithium intercalating carbonaceous coke is noted as an anode material (col. 1, lines 35-45.) Liquid, solid and polymer electrolytes are noted. The reference shows that practical amounts of electrolyte are added to the cell (col. 6, lines 1-25.) The reference does not teach the amount of electrolyte solution in the container adjusted to provide a void in the container of not less than 0.14 cc and not larger than 0.21 cc per 1 Ah of the cell capacity.

Barker et al. (US 2003/0129492) teaches a cathode active material containing the compound of an olivine structure of the formula $Li_xFe_{1-y}M_yPO_4$, for a non-aqueous secondary cell, an electrolyte and an anode, where the contents are housed in a container (paragraph 56 bridging pages 6-7.) $LiFePO_4$ is specifically noted (See p. 66-73; it is again noted that the amount of M in the claim may be equal to 0; additional atoms are added as taught in claims 26-37.) The cathode is mixed with carbon materials (p 58.) Lithium intercalating carbonaceous

coke is noted as an anode material (paragraphs 11, 58.) Liquid, solid and polymer electrolytes are noted (p. 59-62.) Barker et al. (US 2003/0129492) teaches the cathode active material containing the compound of an olivine structure of the formula $Li_xFe_{1-y}M_yPO_4$, wherein M is Mg, Ca, and Zn (claims 1-37.) The reference does not teach the amount of electrolyte solution in the container adjusted to provide a void in the container of not less than 0.14 cc and not larger than 0.21 cc per 1 Ah of the cell capacity.

JP 2646657 teaches a non-aqueous lithium secondary cell having a wound electrode assembly in a container with an electrolyte, where the battery is formed with a specific void ratio made by adjusting the quantity of electrolyte to provide a clearance of 0.3 cc. Although the JP 2646657 reference does not specifically disclose an amount of electrolyte solution in the container adjusted to provide a void in the container of not less than 0.14 cc and not larger than 0.21 cc per 1 Ah of the cell capacity, the reference teaches the void area prevents deformation or leakage due to gas generated during charge and discharge of the battery. The reference also does not teach a cathode employing cathode active material containing the compound of an olivine structure of the formula $Li_xFe_{1-y}M_yPO_4$, as claimed wherein M is at least one selected from the group consisting of Zn, Al, Ga, Mg, and, wherein $0.05< x < 1.2$ and $0 < y$ 0.8.

None of the references teach that the difference, t, between the width of the anode and the width of the cathode is 0.05 mm to 0.2 mm. As the prior art does not teach or render obvious the instant invention, as claimed, the claims are allowed. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 571-272-1291. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-6:30.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mark Ruthkosky
Primary Patent Examiner
Art Unit 1745

4/13/2006